BOWLING BALL RETRIEVING DEVICE

CROSS-REFERENCES TO RELATED APPLICATIONS

None

Statement as to right to inventions made under Federally sponsored research and development:

Not applicable.

BACKGROUND OF THE INVENTION

The field of the invention is generally that of a positive contact bowling ball return device and more specifically to a convexo—concave ball retrieving apparatus so fabricated as to capture, guide, lift and deposit in one smooth continuous flowing motion, a bowling ball for subsequent discharge into a bowling ball return. In the bowling industry there are certain mechanical malfunctions directly associated with the operation of automatic bowling machinery, these problems are most commonly referred to as spinners, Yo-yos and line stoppages. It is these machinery malfunctions that constitute a meaningful overhead cost to the industry, these unnecessary problems result in a loss of revenue due to equipment downtime, bowler inconvenience, frustration, loss of customer satisfaction and the added cost for providing the personnel whose time would be better spent for other maintenance.

In reference to the Brunswick automatic pinsetter bowling machine, in particular models A and A2 which constitute a major percent of the bowling market, the bowling ball automatically finds its way for deposit onto the ball return wheel. It is at this time that the malfunction called spinning occurs. When the large static mass of a round bowling ball, excess oil on the ball and a lack of friction meet a continuously moving ball return wheel, moving at approximately 36 R.P the bowling ball will take the path of least resistance and just sit there and spin. It is this same lack of friction that causes the ball to yo-yo or malfunction in another location of the ball return path The environment inherent to the operation of automatic bowling equipment is naturally oily, dirty and subject to electrostatics which act in convert to attract even more dirt, it is this oil and dirt that introduces slippage and drag and acts as a deterrent to maintaining a constant friction for a smooth, efficient, trouble free and timely bowling ball return. It will be appreciated by those skilled in the art that to insure that a large mass bowling ball will be return routed, through automatic machinery without slippage or drag, requires a precise amount of applied friction.

It is an observation of this inventor that it has been indeed difficult, for manufactures, to achieve and maintain this correct amount of friction due to the constantly changing machine environment of oil and natural wear and the large mass of the ball. Prior art has superficially approached this problem of friction, mass and the phenomena of spin by applying three thin strips of carpet or belting material to the ball return wheel, held in place by adhesives and by increasing the r.p.m. of the automatic machinery. Application of this disposable ball kicker, by prior art, provides inadequate and only temporary friction as the tape very quickly again becomes saturated with oil creating a potential fire hazard, becomes ineffective and must be continuously disposed of in land fills. Typical costs to the operators for three eighteen inch strips of tape per machine, in a fifty-lane bowling alley, could be in excess of two hundred dollars per month and than must be replaced.

It will be appreciated by those skilled in the art that this one piece stand alone ball retriever device, having no moving parts, that captures, guides, lifts and deposits in one continuous flowing motion eliminates the need for disposable ball kickers and other ball return aids having moving parts.

It will be further appreciated by those skilled in the art that this one piece positive contact device will no longer require the higher machine speed of 36 R.P.M., it can now be operated at approximately ⅓ the R.P.M. thereby reducing the ball wheel revolutions, excessive wear on the guide rollers, flanges, drive belts, bearings, pulleys, reducing ball and pin damage, extend machinery life and will result in an overall energy savings. It is another observation of this inventor that the ball lift rods will no longer have to be manufactured with a rubber coating to provide friction as the lead guide finger of this device capture and holds the ball in a concave radius, applying a constant pressure against the back ball lift rod. It is a further observation of this inventor that due to the ball retriever one piece simplicity it would ultimately be incorporated into the manufactures fabrication of the ball return wheel.

SUMMARY OF THE INVENTION

The present invention is a one piece structure having no moving parts that when secured to the ball return wheel captures, guides, lifts and deposits in one smooth continuous flowing motion, a bowling ball for subsequent discharge into a bowling ball return. This positive action device provides the integrity of a constant friction against a bowling ball on its return path through automatic bowling machinery, it being impervious to slippage caused by lubricants and drag caused by dust and dirt. This device eliminates the need for disposable ball kickers and other ball return aids having moving parts and allows the automatic machinery to be operated at a lower r.p.m. thereby extending machinery lifetime and for a savings of energy.

It is an object of the invention to provide the user a device that reduces automatic bowling machinery downtime and a subsequent loss of revenue by eliminating spinners and ball hang-ups regardless of how much oil is on the ball.

It is another object of the invention to provide the user a one piece device, having no moving parts, that eliminates the need for disposable ball kickers and other ball return aids having moveable components.

It is a further object of the invention to provide the user a more environmentally friendly device that eliminates the need for the disposal of oil soaked rubber ball kickers and carpet strips into land fill areas.

It is another object of the invention to provide the user safer operation of automatic bowling machinery by eliminating a potential fire hazard posed by the presence of oil saturated kicker strips.

It is further object of the invention to provide the user a device that reduces the excessive wear on automatic bowling machinery such as bearings, guides, belts and drives by allowing the user to operate the equipment at a lower r.p.m.

It is another object of the invention to provide the user a more energy efficient operating system by allowing them to operate at a lower r.p.m.

It is a another object of the invention to provide the user a device that reduces bowling ball and pin damage by allowing them to operate at a slower r.p.m.

It is a further object of the invention to provide the user a device that helps speed bowling pins on the rear of the pit